Brand: CNCGLASS

Company: CNC Ucolin Interlayer Technology Co., Ltd.

Address: SHENZHEN, GD, CHINA

Peter Lin | cnc@cncGlass.com | WhatsApp/Mobile +86 15013829504 | WeChat wecan365 | www.cncglass.com

TECHNICAL NOTE

Silicone Vacuum Bags for Glass Lamination: Why Bagging Quality Decides Yield

By Peter Lin

CNCGLASS · The consumable that quietly runs the line

Autoclaves and vacuum furnaces attract most of the capital discussion on a laminated-glass floor. In day-to-day quality, another item often decides whether a stack leaves the oven clear or returns as rework: the silicone vacuum bag. Ghost bubbles that appear after cool-down, edge tunnels that follow the perimeter, and soft delamination starting at corners frequently trace back to how the bag evacuated air and how evenly atmospheric pressure loaded the glass.

CNCGLASS works with plants that run EVA, ionoplast (SGP-family), PVB, and switchable PDLC builds on vacuum laminators. This note explains what a high-temperature silicone bag actually does, how it compares with ordinary rubber and disposable nylon films on total cost, and how to select and maintain bags so interlayer chemistry can do its job.

CNCGLASS · Two enemies of a clear laminate: leftover air and uneven load

Before the interlayer melts and wets glass, any residual air between plies becomes a defect seed. After melt begins, uneven clamping pressure lets that air migrate into visible pockets or edge channels. A correctly sealed silicone bag attacks both problems at once: continuous evacuation pulls gas out of the layup, while outside atmosphere presses inward at roughly one bar of differential—an isostatic squeeze that wraps flat panels, bends, and irregular outlines without hard tooling spots.

Unlike a rigid press, the flexible membrane follows thickness steps from artistic inserts, metal meshes, or fabric inlays. That conformity is why vacuum-bag lines can laminate shapes that are awkward or uneconomic for large autoclave cycles alone.

CNCGLASS · What high-tear silicone brings to repeated heat cycles

Glass-lamination bags that last are typically built from high tear-resistant, high-temperature silicone rubber. The Si–O backbone tolerates the heat window of vacuum ovens and retains elasticity after many thermal cycles. Elastic recovery keeps the bag draping tightly around edges instead of permanently stretching into wrinkled “memory” that leaks vacuum or prints texture into soft interlayer.

In practice, operators should treat the bag as a precision seal, not a disposable tarp: clean the working face, protect sharp glass corners with appropriate padding where needed, and retire bags that crack, harden, or can no longer hold deep vacuum.

CNCGLASS · Three jobs the bag must finish every cycle

1. Complete de-airing before melt locks the voids

Evacuation must finish while the interlayer is still soft enough for air paths to close. If heat races ahead of vacuum, crosslinking or high melt viscosity traps bubbles that no later pump-down can erase. A bag with reliable seals and correctly placed breathers gives the pump a continuous path to the nozzle.

2. Edge pressure that limits EVA squeeze-out without starving the bond

Atmospheric loading concentrates useful pressure at the perimeter. That helps suppress edge tunnels and reduces uncontrolled EVA overflow, provided seal strips and bag fit are sound. Excess local stress from folds or misplaced clamps can still mark glass or starve flow—layout discipline matters as much as bag grade.

3. Holding stack alignment during transfer and heat

Once vacuum is established, the bag acts like a soft fixture: plies stay registered while the cart or tray moves into the furnace and through the temperature ramp. Misalignment that shows up after cure often began as a bag that lost vacuum mid-transfer or that bridged poorly over thickness steps.

CNCGLASS · Silicone versus common rubber and disposable nylon — TCO view

Purchase price alone misleads. Plants that count cost per successful cycle usually find durable silicone bags cheaper than low-grade rubber that yellows interlayer or nylon films that discard after one or few uses. The comparison below is a shop-floor framing, not a branded product claim.

Factor	HT silicone vacuum bag	Common rubber sheet	Disposable nylon bag film
Service temperature	Matched to vacuum-oven glass cycles; stable through repeated heat	Often lower ceiling; aging accelerates under heat	Grade-dependent; many films are single-use or short-run
Elongation / drape	High (commonly >600% for quality sheets); wraps curves and steps	Moderate; can tear at sharp corners	High draw possible, but puncture risk rises on corners
Reuse	Thousands of cycles with care	Limited; hardening and cracks appear earlier	Typically one cycle or a short series
Aging / chemistry risk	Stable silicone; low risk of sulfur-type staining when formulated for glass	Some compounds can yellow PVB/SGP via sulfur or plasticizer migration	Residue and seal reliability vary by film lot
Cost per good cycle	Higher unit price, lower amortized cost when yield is stable	Cheap unit price, higher scrap and early replacement	Low unit price, high consumable spend at volume

CNCGLASS · What different interlayers need from the bag

EVA on vacuum-oven lines

CNCGLASS EVA grades typically follow staged heat with a de-air window and a cure hold. Across roughly 70–135 °C, the bag must keep a stable seal so vacuum never collapses while the film softens, wets, and gels. A leak that appears mid-ramp is a classic path to edge micro-bubbles and delayed center haze.

SGP-family ionoplast and PVB

Stiffer interlayers and heavier stacks put more stress on bag corners and cutouts. Tear strength becomes critical—target sheets that deliver tear resistance of at least about 28 N/mm—so a sharp glass corner or hardware opening does not start a zipper tear that dumps vacuum mid-cycle.

PDLC and other optics-critical builds

Switchable films and fine decorative inserts can pick up surface texture from a coarse bag face. Prefer a smooth or finely textured working surface so bag grain does not print through into the optical path.

CNCGLASS · Where silicone bags earn their keep

- Curved and irregular outlines that need isostatic wrap rather than flat press plates.
- Artistic inserts with thickness steps—fabrics, papers, meshes—where air paths are complex.
- Small and mid-size shops that rely on vacuum furnaces instead of full autoclave pressure.
- Prototype and short-run architectural pieces where tooling for every shape is not economical.

CNCGLASS · Selection checklist for production buyers

- Thickness: about 2–3 mm is a common production balance of drape, puncture resistance, and heat mass.

- Surface: textured faces can help breathability in some layouts; smooth/fine faces protect PDLC and clear decorative work.
- Mechanical targets (generic industrial guidance): Shore A around 55; tensile strength ≥7 MPa; tear ≥28 N/mm; elongation typically 500–650% (many quality sheets exceed 600%).
- Connectors: choose metal or silicone fittings that match your hose and pump; weak joints are frequent false-vacuum causes.
- Large panels: plan multi-channel vacuum distribution so remote corners evacuate as fast as the nozzle zone.
- Width: industry-capable seamless sheets can reach on the order of about 3800 mm for large architectural formats—confirm available width for your panel family without over-claiming a single mill's catalog.
- Service life: well-handled bags often deliver thousands of cycles before elasticity or seal integrity falls off.

CNCGLASS · FAQ

How many times can one bag be reused?

Under careful handling—clean faces, protected corners, correct vacuum practice—many plants see on the order of 3000–5000 cycles. Abuse, untreated sharp edges, and overheating shorten that range sharply.

When should we retire a bag?

Replace when you see cracking, permanent hardening, sticky degraded patches, or when the bag can no longer hold deep vacuum near about −0.095 MPa (or your plant's proven target) under a standard empty-bag or coupon check.

How do we cut ghost bubbles and edge defects tied to bagging?

Keep the bag face clean, place breather cloth or mesh near the vacuum nozzle so the port does not seal against glass, verify seal-strip continuity, and confirm vacuum depth before the heat ramp enters the melt window. Do not rely on higher temperature alone to "cook out" air the bag failed to remove.

Why avoid low-grade rubber for PVB or SGP?

Some non-silicone compounds can transfer sulfur or other residues that yellow or stain sensitive interlayers. For ionoplast and PVB optics, stick with glass-proven high-temperature silicone rather than cheap general-purpose rubber sheet.

Do we need different bags for EVA versus SGP?

Often the same silicone family works, but SGP and thick multi-ply stacks usually need higher tear strength and more careful corner protection. EVA staged-heat lines emphasize long, leak-free vacuum through the soft stage. Match thickness, surface finish, and connector layout to the hardest job on your schedule.

CNCGLASS · Closing note

A silicone vacuum bag is not a minor accessory. It is the foundation that lets atmospheric pressure and continuous evacuation deliver clear, well-bonded laminates cycle after cycle. Plants that specify tear strength, surface finish, and connector quality—and that retire bags before seals fail—protect interlayer investment and stabilize yield. For bagging practice alongside CNCGLASS EVA and related interlayer process windows, contact CNCGLASS.

CNCGLASS · Contact

Brand: CNCGLASS

Company: CNC Ucolin Interlayer Technology Co., Ltd.

Address: SHENZHEN, GD, CHINA

Contact: Peter Lin

Email: cnc@cncGlass.com

WhatsApp / Mobile: +86 15013829504

WeChat: wecan365

Website: www.cncglass.com

CNC Ucolin Interlayer Technology Co., Ltd. · SHENZHEN, GD, CHINA · Peter Lin

Ask CNCGLASS for vacuum-bag selection, EVA/SGP process windows, and laminator bagging support.